

NONPOINT SOURCE PIP SUMMARY FORM – PHASE 1

Begin here by typing in the year. Then tab or place your cursor in each gray shaded field as desired.

Federal Fiscal FY: 2005 Today's Date: 1/18/2005

Select project type from the drop-down box below:

Project Type: WATERSHEDS

PROJECT TITLE: Lower James River Watershed Assessment

PROJECT SPONSOR

NAME: James River Water Development District

ADDRESS: PO Box 849

ADDRESS:

CITY: Huron STATE: SD ZIP: 57350

PHONE: 800-99-RIVER EXT:

FAX: 605-352-0606 E-MAIL: JRWDD@basec.net

PRIMARY CONTACT

NAME: Darrel Raschke PHONE: 605-350-3895 EXT:

SIGNATORY NAME: PHONE: (OPTIONAL)

STATE CONTACT PERSON:

NAME: Sean Kruger

PHONE: 605-773-2457 EXT:

FAX: 605-773-4068

E-MAIL: Sean.Kruger@state.sd.us

CATEGORY & FUNCTIONAL CATEGORY

Drop-down lists. Please select up to 4 categories below.

NPS Category and Percent

The primary category of pollution is intended to identify the principal or main pollutant(s) the project is attempting to correct. The selections are obtained from drop-down list associated with the data element.

NPS CATEGORY	Percent
AGRICULTURE	50
ANIMAL FEEDING OPERATIONS	45
URBAN RUNOFF/STORMWATER	5

NPS Functional Category

These activities are intended to identify the principal or main approach, remedy, or solution to achieve the objective of the project. Selections are obtained from the drop-down list associated with the data element.

NPS FUNCTIONAL CATEGORY OF ACTIVITY
WATERSHED ASSESSMENTS
WATER QUALITY ASSESSMENT/MONITORING

WATERSHED NAME: James River Basin

USGS HYDROLOGICAL UNIT CODE: 10160011

LATITUDE/LONGITUDE

Use degrees and decimals only. Do not put in degrees, minutes, seconds. For example: put in 45.55 rather than 45 deg 30 min 30 sec.

PROJECT LOCATION LATITUDE: 43.7 LONGITUDE: -97.9

NONPOINT SOURCE PIP SUMMARY FORM – PHASE 1

WATERBODY TYPE

A name indicating the type of waterbody/watershed associated with the NPS project.

RIVERS/STREAMS
LAKES
RESERVOIRS
STREAMS

TMDL AND CLEAN LAKES INFORMATION

A field that identifies the relationship of the given nonpoint source project's funding to total maximum daily load (TMDL) activities.

TMDL PRIORITY: HIGH

TMDL DEVELOPMENT?: YES

TMDL IMPLEMENTATION?:

CLEAN LAKES PROJECT?: YES

POLLUTANT TYPE

The name of the pollutant that the particular nonpoint source project is attempting to address. Selection of the pollutant is made from drop-down list.

Pollutants not listed in POLLUTANTS box if needed. Selection of the pollutant is made from the drop-down list.

POLLUTANTS:

PATHOGENS (COLIFORM)
TURBIDITY
NUTRIENTS

ADDITIONAL POLLUTANTS:

FUNDING

PLEASE TAB OUT OF THE FIELD AFTER ENTRY

FY\$319(h) BUDGET FUNDS: &152,767

NON-FEDERAL MATCHING FUNDS: \$220,000

OTHER FEDERAL FUNDS: \$237,233

STATE FUNDS: \$0

LOCAL FUNDS: \$220,000

TOTAL BUDGET: \$610,000

OTHER FUNDS:

STATE 319(h) FTE's FUNDED UNDER THIS GRANT: 2.75

GOALS AND PROJECT DESCRIPTION

NOTE: To add the GOALS and PROJECT DESCRIPTION just TAB to the shaded area and type or cut/paste text. You may type or cut/paste as much text as you like. The box will expand.

Narrative fields used to provide the anticipated benefits and goals of the project and the project description.

GOALS: The long-term goal of the Lower James River Watershed Assessment is to locate and document sources of nonpoint source pollution in the watershed and produce feasible restoration recommendations. The project will provide information needed to develop a watershed implementation work plan with the objective of decreasing erosion, sedimentation, and fecal coliform loadings in the river/stream miles and nutrients in the lakes included in the project area. This project will result in a TMDL report for the 303(d) listed segments and lakes of the James River downstream of the Beadle/Sanborn County Line. The parameters of concern in these segments include suspended solids, fecal coliform bacteria and nutrients.

PROJECT DESCRIPTION: The Lower James River Watershed Assessment includes drainage from approximately 16 counties in southeastern South Dakota. The watershed area is approximately 2.5 million acres or (10,350 km²). Beaver Lake and Lake Carthage are included in the Lower James River basin, and are listed on the 303(d) for TSI values above their ecoregion target.

This assessment is intended to be the initial phase of a watershed-wide restoration project. Through water quality monitoring, stream gaging, stream channel analysis, and land use analysis, the sources of impairment to the stream and the watershed will be documented and feasible alternatives for restoration will be presented in a final project report.

PROJECT SUMMARY SHEET

PROJECT TITLE: Lower James River Watershed Assessment

NAME AND ADDRESS OF LEAD PROJECT SPONSOR:

James River Water Development District
PO Box 849
Huron SD 57350

LOCAL CONTACT:

Darrell Raschke
Executive Director
James River Water Development District
PO Box 849
Huron SD 57350
PHONE: (800) -99-RIVER
FAX: (605) -352-0606

STATE CONTACT:

Sean Kruger
Joe Foss Building
523 East Capitol
Pierre, SD 57501
PHONE: (605) 773-2457
FAX: (605) 773-4068

STATE: South Dakota **WATERSHED:** Lower James River **HUC #** 10160011

PROJECT TYPES: BASE WATERSHED GROUNDWATER I&E

WATERBODY TYPES

- Groundwater
- Lakes/Reservoirs
- Rivers
- Streams
- Wetlands
- Other

NPS CATEGORY

- Agriculture
- Urban Runoff
- Silviculture
- Construction
- Resource Extraction
- Stowage and Land Disposal
- Hydrologic Modification
- Other

SUMMARIZATION OF MAJOR GOALS:

The long-term goal of the Lower James River Watershed Assessment is to locate and document sources of nonpoint source pollution in the watershed and produce feasible restoration recommendations. The project will provide information needed to develop a watershed implementation work plan with the objective of decreasing erosion, sedimentation, and fecal coliform loadings in the river/stream miles and nutrients in the lakes included in the project area. This project will result in a TMDL report for the 303(d) listed segments and lakes of the James River downstream of the Beadle/ Sanborn County Line. The parameters of concern in these segments include suspended solids, fecal coliform bacteria and nutrients.

PROJECT DESCRIPTION:

The Lower James River Watershed Assessment includes drainage from approximately 16 counties in southeastern South Dakota. The watershed area is approximately 2.5 million acres or (10,350 km²). Beaver Lake and Lake Carthage are included in the Lower James River basin, and are listed on the 303(d) for TSI values above their ecoregion target.

This assessment is intended to be the initial phase of a watershed-wide restoration project. Through water quality monitoring, stream gaging, stream channel analysis, and land use analysis, the sources of impairment to the stream and the watershed will be documented and feasible alternatives for restoration will be presented in a final project report.

FY 2005 319 funds requested: \$152,777
Federal 604b: \$60,000
Total project costs: \$610,000

319 Match: \$220,000
Federal PPG Carryover: \$177,223
319 Funded Full Time Personnel: 2.75

2.0 STATEMENT OF NEED

- 2.1 The purpose of the Lower James River Watershed Assessment is to determine the sources of impairments, develop a TMDL, and to serve as the foundation of an implementation project. The James River was listed in the South Dakota 2002 303(d) list. The segments listed were the mainstem of the James River from the confluence of Sand Creek and main stem to the Missouri River. Two lakes, Lake Carthage and Beaver Lake were also listed in the 2002 303(d) and will be included in this assessment.

The study watershed drains into the Missouri River at Yankton, South Dakota. The streams in the study watershed contribute loadings of pathogens, nutrients and suspended solids related to snowmelt or rainfall events.

- 2.2 The James River watershed proposed to be assessed in this study is approximately 2.5 million acres. Located in East Central South Dakota, the James River is one of the most important rivers in the state. The James River is a perennial stream and the tributaries range from perennial to intermittent.

Lake Carthage is reservoir on the Redstone Creek near the town of Carthage, SD. The reservoir has a surface area of approximately 82 ha (203 acres) with a watershed of approximately 38,272 ha (94,574 acres). The maximum depth is approximately 7 meters (23 feet). The TSI values of Lake Carthage are in excess of 70.

Beaver Lake is located in Yankton County. The lake has a surface area of approximately 29 ha (72 acres) and lies within a 76,360 acre watershed. The maximum depth is approximately 1.5 meters (4.5 feet). The TSI values of Beaver Lake vary from 65 to 100.

The species listed in the federal list of threatened and endangered species are the bald eagle (*Haliaeetus leucocephalus*), Topeka Shiner (*Notropis topeka*), Interior Least Tern (*Sterna antillarum athalassos*), Piping Plover (*Charadrius melodus*)(SDGFP, 2003). These species will not be impacted by the assessment work of this project.

- 2.3 The location of the James River Watershed Assessment Project can be found in Figure 1. The watersheds for Lake Carthage and Beaver Lake follow in Figures 2 and 3, respectively.
- 2.4 The James River Basin watershed lies entirely within the Level III Ecoregion of the Northern Glaciated Plains.

Lower James Assessment Area

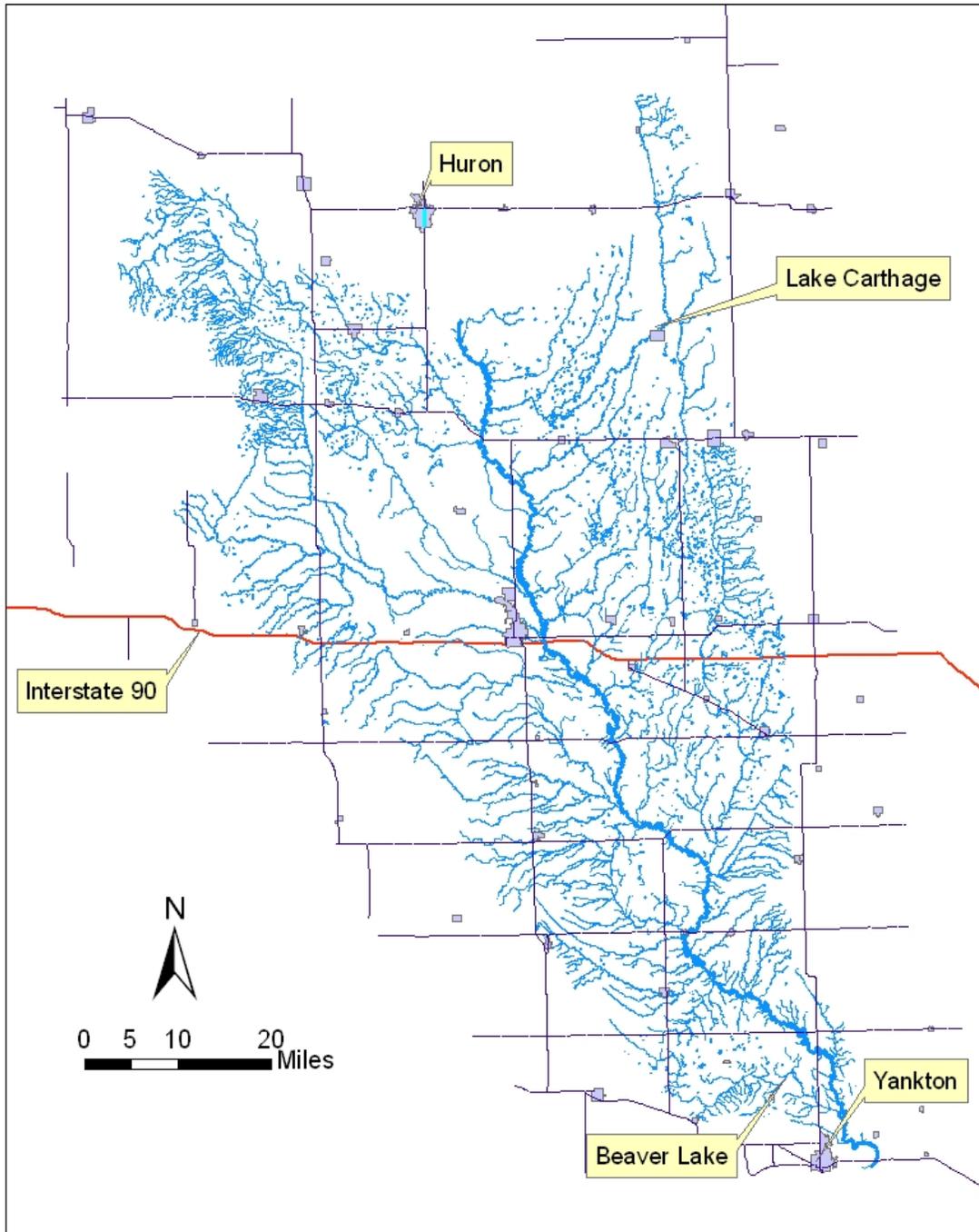


Figure 1. Lower James Assessment Area

Lake Carthage Watershed

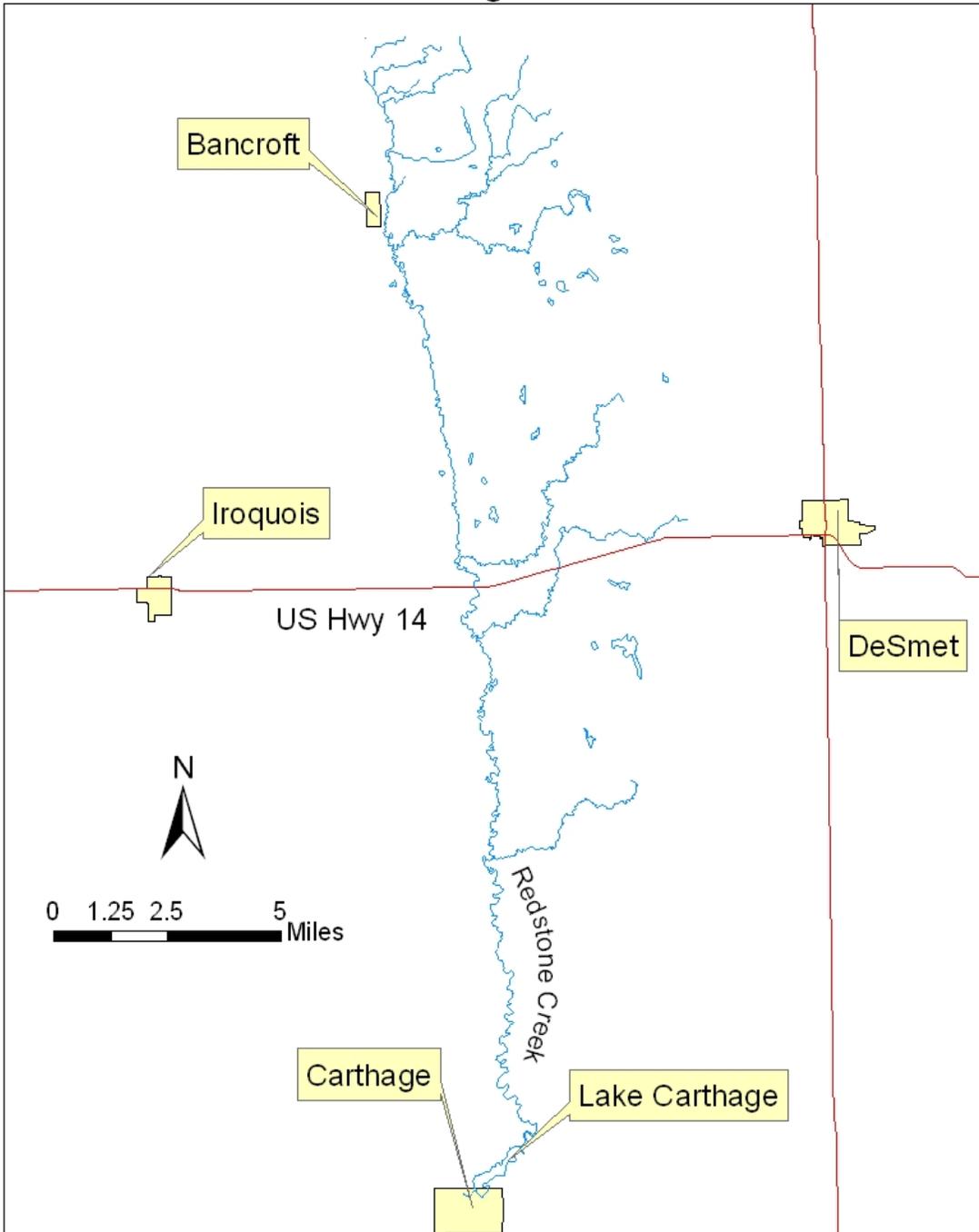


Figure 2. Lake Carthage Watershed

Beaver Lake Watershed



Figure 3. Beaver Lake Watershed

Limited information is available on the land use for this project area. During the assessment this information will be gathered and included in the final report. It is known that the watershed is dotted with small communities surrounded by primarily row crop agriculture. There is some pasture and hay ground in areas not suitable for row crop farming. There are also a large number of animal feeding areas in the watershed. Detailed information will be gathered during the assessment project. Being a large basin that touches 16 counties, the soils range from well drained to poorly drained, and level to steep. There is a large mix of uplands, swales, and wetland depressions. Erosion rates will be determined by the assessment project.

There are approximately 30 communities within the project area. The populations range from less than 100 as in the city of Kaylor to over 10,000 in Mitchell. Many of these municipalities have discharge permits. The information from these will be included in the final assessment report.

The James River basin has a subhumid, continental climate characterized by pronounced seasonal differences in temperature, precipitation, and other climatic variables. Temperature varies from the northern to the southern end of the basin. Annual temperatures are slightly cooler at the northern parts of the basin. January is typically the coldest month and July is typically the warmest month.

The average annual precipitation in the watershed is somewhat variable, both spatially and temporally, ranging from 22 to 26 inches. Generally, average annual precipitation decreases as you move north within the study watershed.

- 2.5 The James basin was listed on the 303(d) list for suspended solids and fecal coliform. The lakes were listed for TSI values higher than their ecoregion targets. The sources for these listings will be determined during the assessment project. Most likely the sources are agricultural, however point sources in the area will be assessed and all results will be included in the final assessment report.

3.0 PROJECT DESCRIPTION

3.1 GOALS

The goal of this assessment project is to determine and document sources of impairments to the James River watershed with specific reports being generated for Lake Carthage and Beaver Lake. After the assessment TMDLs will be written that will establish the water quality target and the methods needed to accomplish each TMDL. Critical areas of the watershed will be identified for implementation activities.

3.2 OBJECTIVES AND TASKS

Objective 1: Stream Sampling

Collect discharge measurements and water quality samples/measurements from the James River and tributaries necessary to estimate water quality parameter loadings.

TASK 1 Develop stage discharge tables for all stream sites.

Water-level recorders will be installed at DENR-gaged sites (Figures 4, 5 and 6), Maintenance of continuous stage recorders will continue for two years with exception of winter months if the water freezes. Three United States Geological Survey (USGS) stream gaging stations are currently active within the project area. Current and historical USGS gage data will be used, where possible.

Discrete discharge measurements will be taken on a regular schedule (monthly) and during storm events for all DENR-gaged sites. Discharge measurements will be taken with either a hand-held current velocity meter under wadeable conditions or with a bridge crane during high flows using methods adapted by the USGS. Continuous records of stage will be obtained with digital recorders. Discharge measurements and stage records will be used to generate stage-discharge relationships.

Discharge measurements and water level data will be analyzed to develop flows for all water quality sampling times. Stage and discharge measurements will be used to update existing gaging station rating curves and develop relationships at new gaging locations. This information will be combined with concentrations of sediment and nutrients to calculate loadings from the watershed.

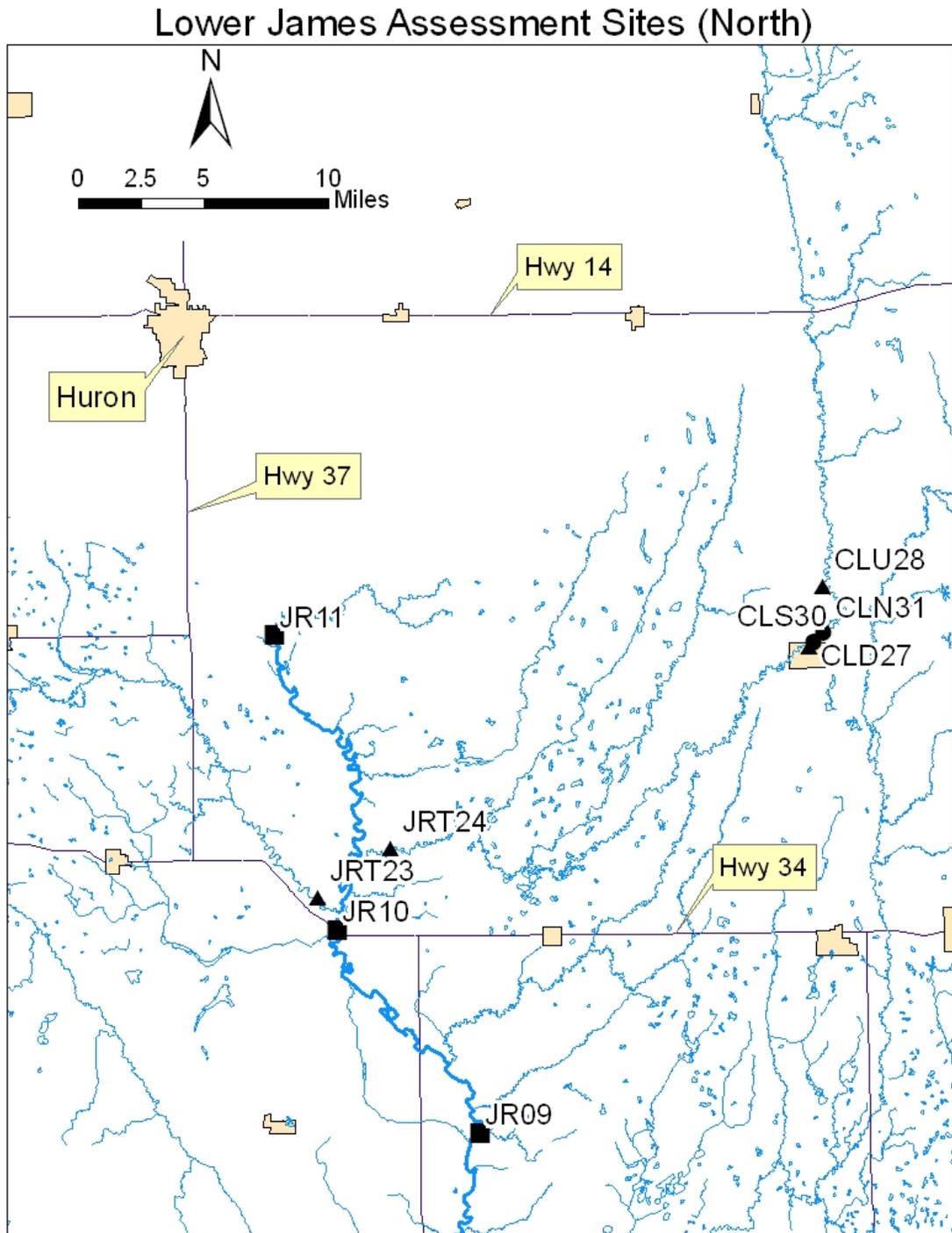


Figure 4. Lower James Assessment Sites (North)

Lower James Assessment Sites (Central)

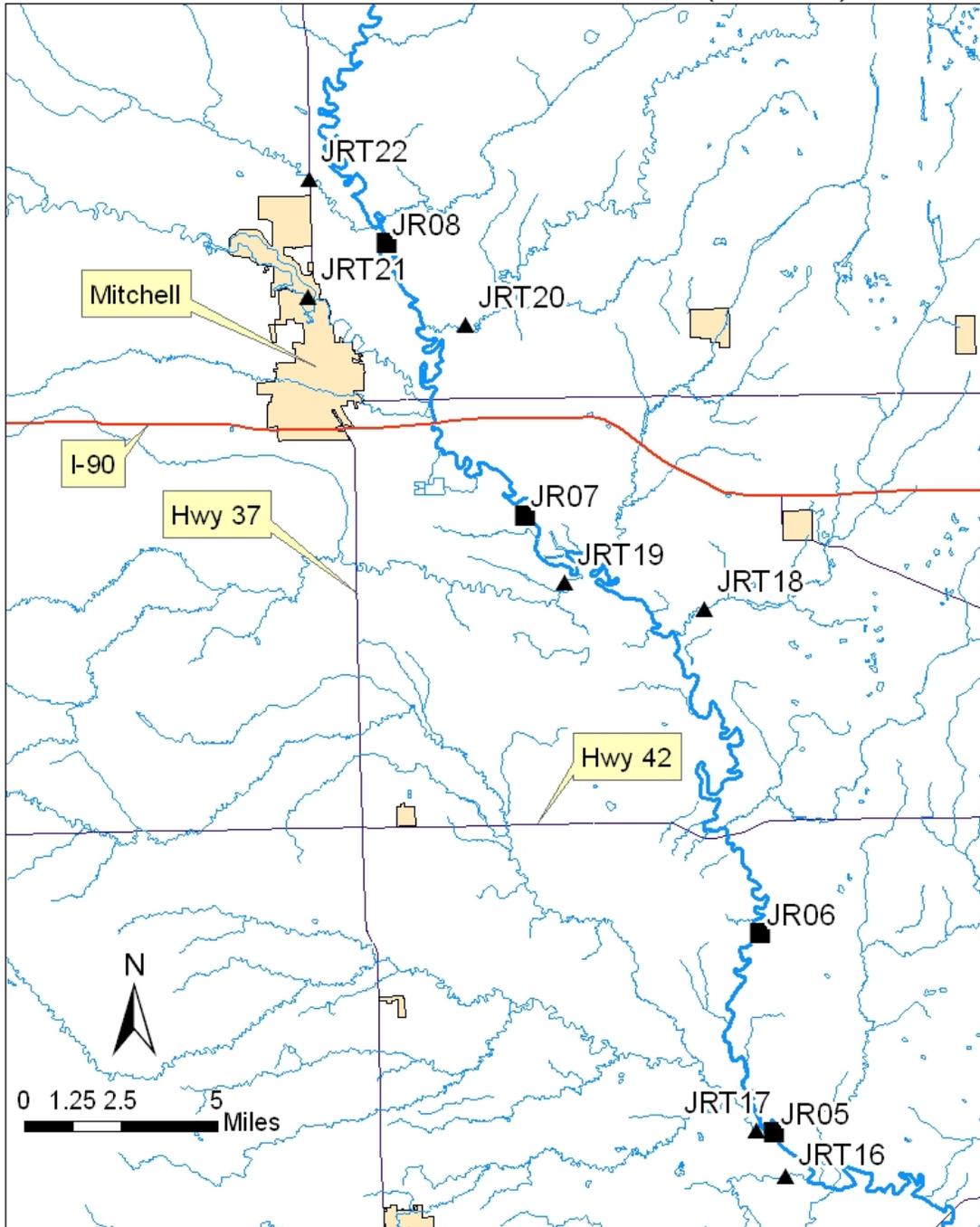


Figure 5. Lower James Assessment Sites (Central)

Lower James Assessment Sites (South)

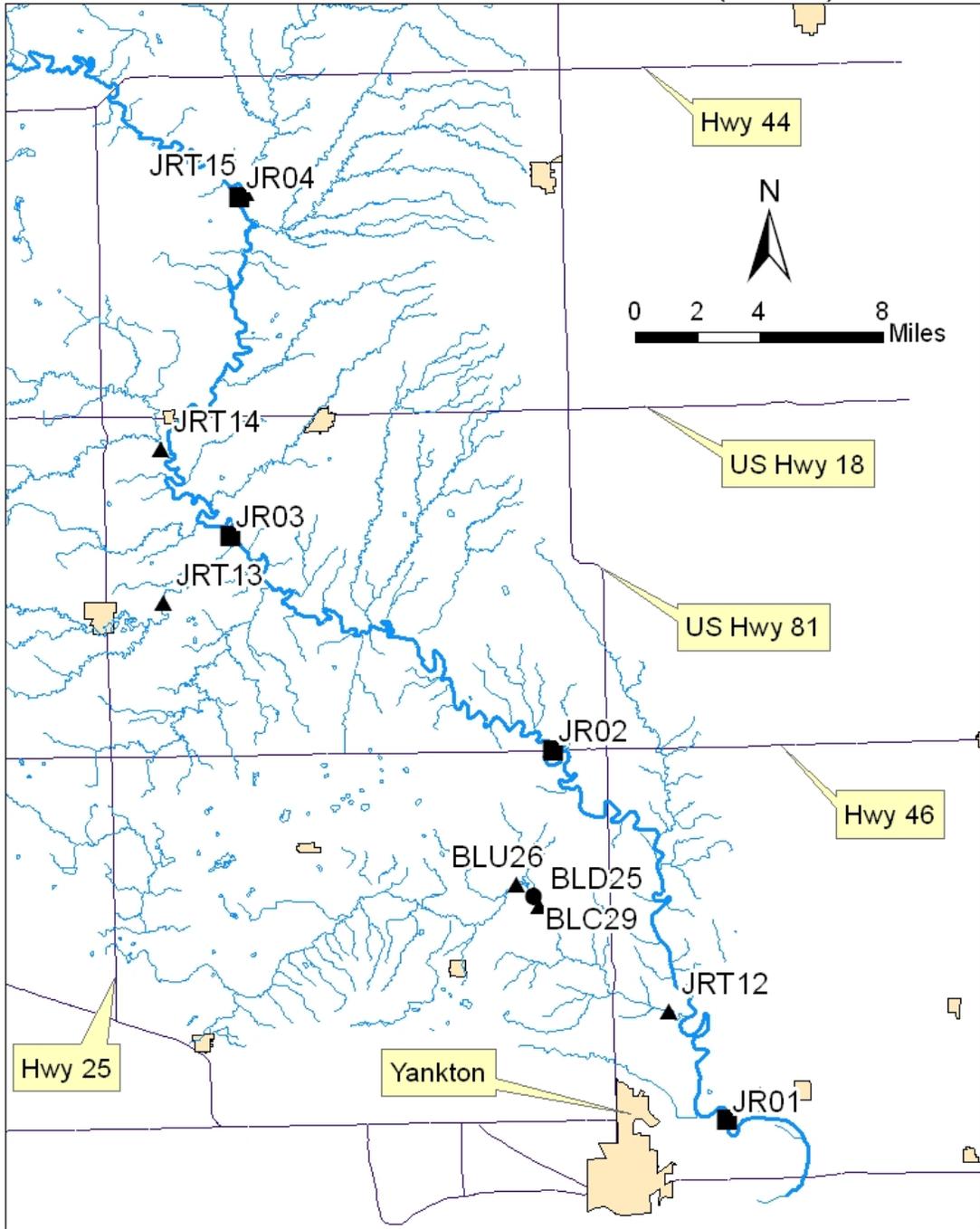


Figure 6. Lower James Assessment Sites (South)

TASK 2 Collect water Quality Samples

Water-quality samples will be collected from stream sites as described in Table 1. Tributary sites will be sampled monthly for two years to collect base-flow data. Nine base-flow samples will be collected each year from each site. A total of 432 base-flow samples will be collected during the project period. Additional samples will be collected during spring runoff and select storm events. Annually, 5 spring runoff and 4 storm samples will be collected at each site for a total of 432 during the project period. Two samples will be collected during the first week of spring snowmelt runoff and once a week thereafter, until runoff ceases, for a maximum of five supplemental spring runoff samples each year. An additional 14 samples will be collected at the inlet/outlet points of the two TMDL Lakes. The total number of baseflow and run-off samples at stream sites for the two year project period is estimated to be 920. The location of proposed stream monitoring sites may be found in Figures 4, 5 and 6, and parameters to be collected are presented in Table 2.

Water samples will be collected with an isokinetic sampler to ensure a depth-integrated sample along the stream cross-section. When a depth-integrated sample cannot be collected (i.e. water depth < 1ft.), then grab sampling methods should be used. All samples will be collected using approved methods described in the State of South Dakota Water Resource Assistance Program Standard Operating Procedures for Field Samplers (WRAP SOP). After collection, sample bottles will be iced and delivered to the SD State Health Laboratory for analysis.

Table 1. Proposed Site names and Locations

Site Name	Site Location	Site Type
JR01	James River@ Yankton	Mainstem
JR02	James River @ Verdin	Mainstem
JR03	James River @ Scotland	Mainstem (USGS)
JR04	James River @ Wolf Creek	Mainstem
JR05	James River @ Milltown	Mainstem
JR06	James River @ 268th St Street	Mainstem
JR07	James River @ Mitchell	Mainstem (USGS)
JR08	James River N of Mitchell	Mainstem
JR09	James River @ 241st Street	Mainstem
JR10	James River @ Forestburg	Mainstem (USGS)
JR11	James River @ Beadle Cnty Line	Mainstem
JRT12	Beaver Creek	Tributary
JRT13	Dawson Creek	Tributary
JRT14	Lonetree Creek	Tributary
JRT15	Wolf Creek	Tributary
JRT16	Dry Creek	Tributary
JRT17	Twelvemile Creek	Tributary
JRT18	Pierre Creek	Tributary
JRT19	Enemy Creek	Tributary
JRT20	Rock Creek	Tributary
JRT21	Firesteel Creek	Tributary
JRT22	Dry Run Creek	Tributary
JRT23	Sand Creek	Tributary
JRT24	Redstone Creek	Tributary
BLD25	Beaver Lake Outlet	Tributary
BLU26	Beaver Lake Inlet	Tributary
CLD27	Lake Carthage Outlet	Tributary
CLU28	Lake Carthage Inlet	Tributary
BLC29	Beaver Inlake	Lake
CLS30	Carthage Inlake	Lake
CLN31	Carthage Inlake	Lake

Table 2. Parameters to be measured at stream sampling sites.

Physical/Field Parameters	Chemical Parameters
Water temperature	Alkalinity
Air temperature	Ammonia as N
Dissolved oxygen	Nitrate + Nitrite as N
Field pH	Nitrogen, Total Kjeldahl (TKN)
Specific conductance	Total dissolved phosphorus
Turbidity	Total phosphorus
Stage	Total solids
Flow	Total dissolved solids**
Visual observations	Total suspended solids
Habitat assessment	Total volatile suspended solids
Fecal Coliform	<i>E. Coli</i>

** Calculated Value

PRODUCTS:

Installation of twenty-five gaging stations (Three tributary sites are already being gaged by USGS).

Discharge measurements will be collected at each site in conjunction with samples and stage discharge curves developed.

920 tributary water quality samples will be collected.

A water quality report will be produced, which will include a description of the relationship between chemical and physical data and the influence of the measured parameters on water quality.

COST: \$138,000 PPG Funds: \$49,750 604 Funds: \$60,000
Sample analysis is based on \$150 per sample

RESPONSIBLE AGENCIES:

Task Responsibilities:

Project Sponsor
SD DENR

Design and Technical Assistance:

South Dakota Department of Environment and Natural Resources

Objective 2: Biological Sampling

Characterize the biological communities within the James River watershed. This information will be used to develop a biological index to supplement assessment of water quality characteristics of the James River watershed. The data will help determine if the water is meeting its beneficial use. Samples will be collected at sites with sufficient water to be sampled during the index. It is assumed approximately 15 tributary sites and the 3 reference sites will have sufficient flow for biological samples.

TASK 3 Collect samples for bacterial source tracking

To help identify the source of the fecal coliform within the watershed, bacterial samples will be analyzed to determine if the source is animal or human. If possible the source of the coliform samples will be analyzed to species. Approximately 20 samples will be collected each year at sites JR01 and JR02.

TASK 4 Biological sampling

Benthic macroinvertebrate samples will be collected twice at each stream monitoring sites each year using methods described in the WRAP SOP. Reference sites will be selected that represent best attainable stream habitat and water quality within the study watershed. A total of 76 benthic macroinvertebrate samples will be collected.

Biological samples will be sent to an independent laboratory for taxonomic identification to the lowest level of taxonomic resolution.

A multimetric index will be used to analyze the macroinvertebrate community data. A suite of candidate metrics will be calibrated and a biological index will be developed to compare study sites to reference sites.

Periphyton samples will be collected twice at each stream monitoring site. Reference sites will be selected that represent best attainable stream habitat and water quality within the study watershed. Seventy Six periphyton samples will be collected during the project period.

Natural substrates will be sampled, where possible, for estimates of algal biomass using methods described in the WRAP SOP.

Chlorophyll *a* samples will be analyzed by SD DENR in the Floyd L. Matthew Environmental Education and Training Center Laboratory, Pierre, SD.

TASK 5 Stream Habitat Assessments

Stream habitats will be assessed at study sites and reference sites using the WRAP SOP habitat assessment protocols. This assessment should occur in conjunction with the biological sampling (benthic macroinvertebrates and periphyton).

Stream habitat data will be compiled according to the WRAP SOP, and a stream habitat condition index will be developed to quantify overall stream habitat condition.

The project sponsor will also conduct a field reconnaissance to identify obvious impairments to stream channels and riparian zones within the James River watershed.

Biological Parameters

Fecal coliform bacteria
E. coli
Macroinvertebrate communities
Ash-free dry mass (periphyton)
Chlorophyll *a* (periphyton)
Bacterial Source Tracking

PRODUCTS:

A total of 76 benthic macroinvertebrate samples collected, identified, and counted. Metrics will be developed for these samples.

A total of 76 periphyton, chlorophyll *a* and ash-free dry weight samples collected.

A total of 40 biological source tracking samples collected.

Stream habitat condition assessed at study and reference sites (24 sites).

COST: \$23,100 PPG Funds: \$11,550
Macroinvertebrate analysis is based on \$225 per sample
Chlorophyll *a* and ash free dry weight analysis will be done at no cost

RESPONSIBLE AGENCIES:

Task Responsibilities:
Project Sponsor

Design and Technical Assistance:
South Dakota Department of Environment and Natural Resources

Objective 3: Lake Assessment

Assess the current water quality of Lake Carthage and Beaver Lake. This information will be used to (1) determine whether or not water quality standards are being maintained, (2) estimate nutrient and sediment trapping, and (3) examine productivity levels (i.e. trophic state) for the lakes.

TASK 6 Collect inlake water quality samples.

Water quality parameters will be sampled at 1 location in Beaver Lake and 2 locations in Lake Carthage (Figures 7 and 8). Table 3 lists the parameters to be measured at reservoir sites. Samples will be collected from surface at all sites and a bottom sample will be collected if the depth is greater than 3 meters. The sample site on Beaver Lake will only have a surface sample while the sites at Lake Carthage will have sufficient depth for both a surface and bottom sample.

Samples will be collected for a period of two years (excluding periods with unsafe ice cover). During June, July, and August, samples will be collected twice each month. Samples in Lake Carthage will not be composited in order to assess spatial variability within the reservoir. A total of 75 samples will be collected from the waterbodies.

Ambient nutrient concentrations and trophic state will be assessed for the lakes. Water column dissolved oxygen and temperature profiles will also be collected at each site on a monthly basis except during June, July, and August, when samples/measurements will be collected twice a month. All samples/measurements will be collected using methods described in the WRAP SOP.

Table 3. Parameters to be measured at the lake sampling sites.

Biological Parameters	Physical/Field Parameters	Chemical Parameters
Fecal coliform bacteria	Water temperature	Alkalinity
<i>E. coli</i>	Air temperature	Ammonia as N
Phytoplankton communities	Dissolved oxygen	Nitrate + Nitrite as N
Chlorophyll <i>a</i> (phytoplankton)	Field pH	Nitrogen, Total Kjeldahl (TKN)
Ash-free dry mass (phytoplankton)	Specific conductance	Total dissolved phosphorus
Submerged macrophytes	Turbidity*	Total phosphorus
	Secchi depth	Total solids
	Water Depth	Total dissolved solids**
	Visual observations	Total suspended solids
		Total volatile suspended solids

* If probe is available on sampling sonde

** Calculated Value

Beaver Lake Assessment Sites

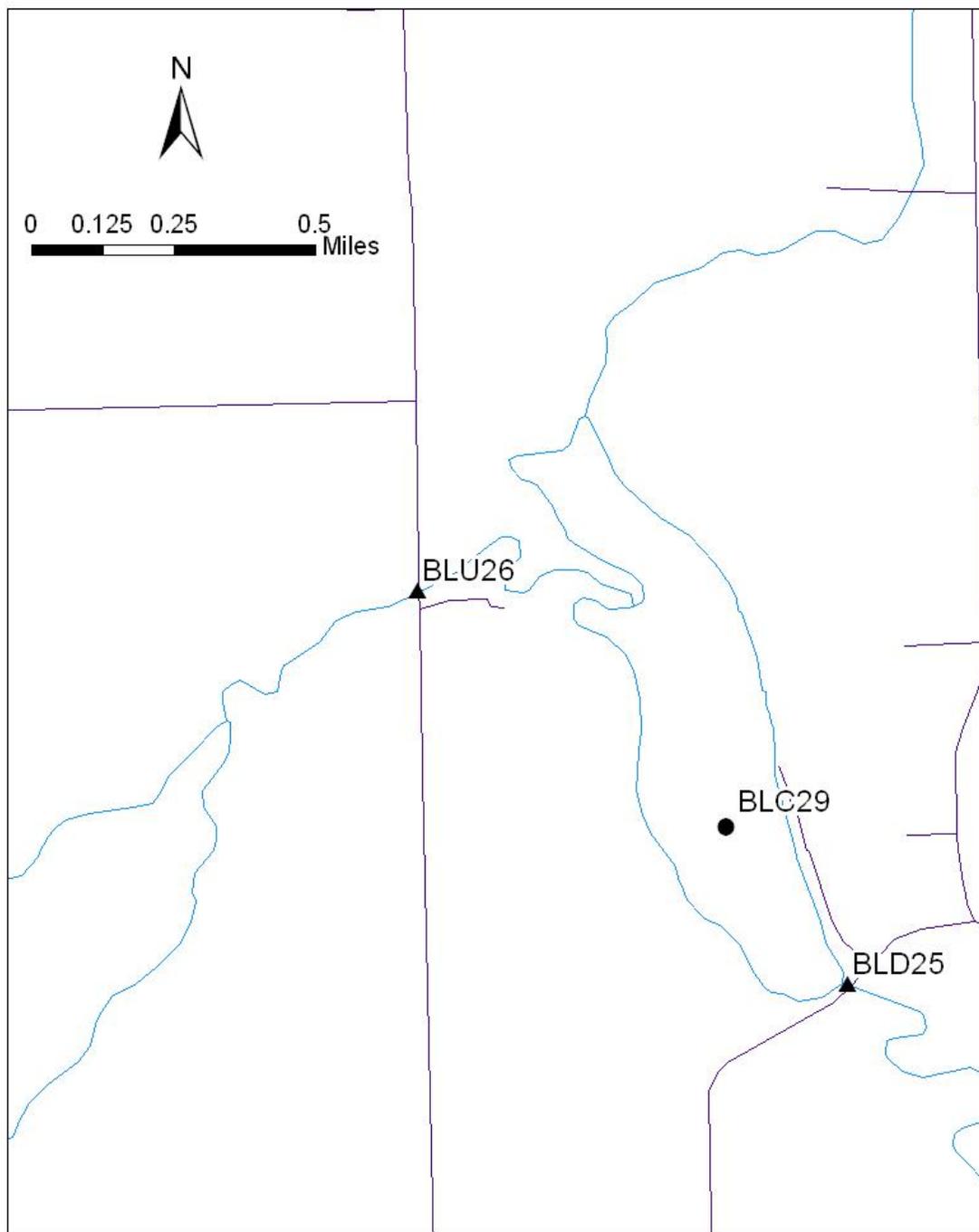


Figure 7. Beaver Lake Sampling Sites

Carthage Lake Assessment Sites

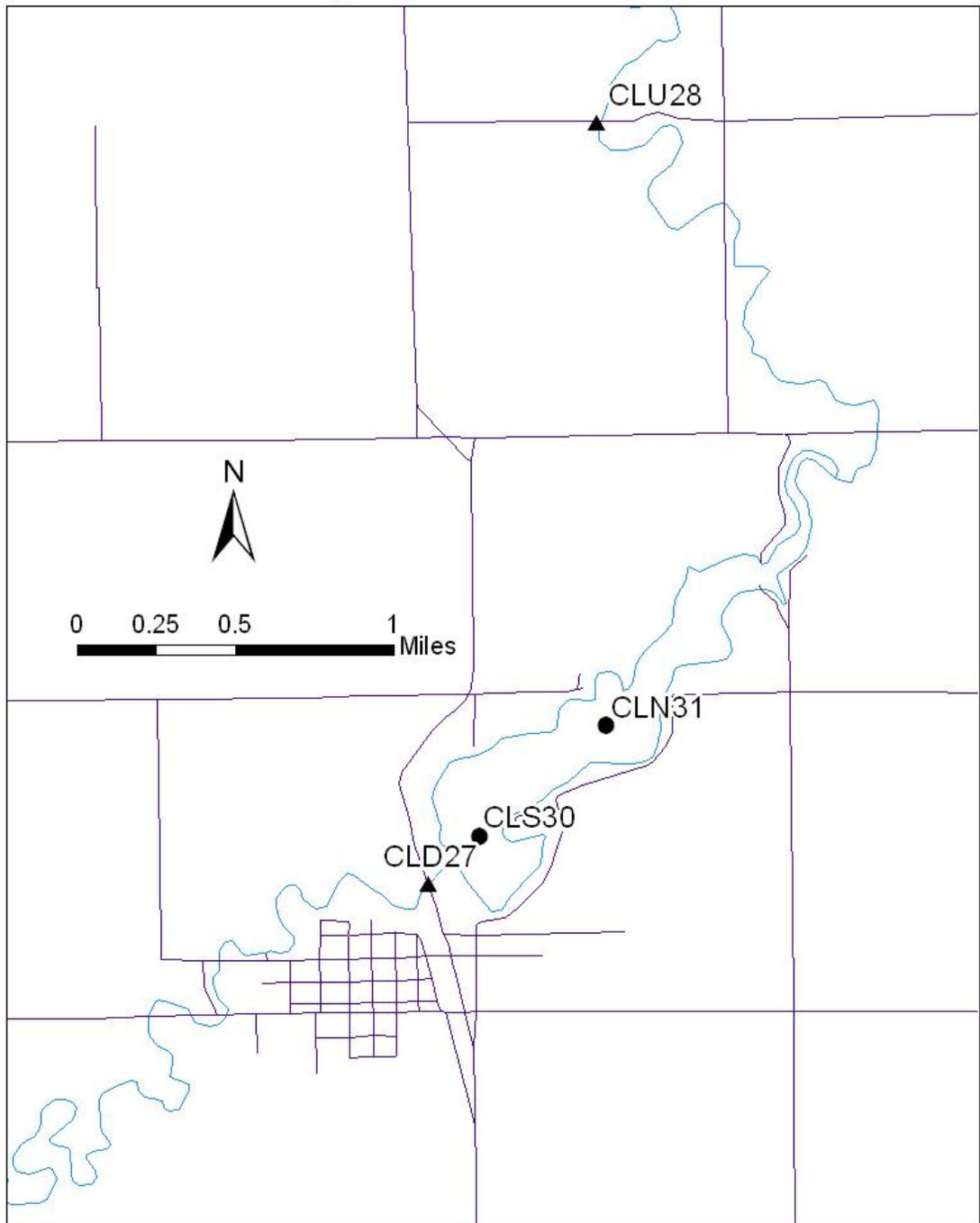


Figure 8. Lake Carthage Sampling Sites

TASK 7 Conduct a macrophyte and shoreline survey of the lakes.

This task will be completed only once during the late summer months (July or August). Macrophytes will be sampled from the reservoir with a plant grapple/rake. A depth finder will be used to locate macrophyte beds and determine the area of coverage of submerged vegetation. Macrophyte density and species composition will be recorded.

A sediment survey will be conducted on both Lake Carthage and Beaver Lake. The sediment surveys will document past sedimentation into the lakes.

PRODUCTS:

A total of 75 reservoir samples will be collected.

A macrophyte and shoreline survey will be conducted once during the project.

COST: \$11,250 PPG Funds: \$7,000
Based on 75 samples @\$150 per sample.

RESPONSIBLE AGENCIES:

Task Responsibilities:
Project Coordinator
Project Sponsor

Design and Technical Assistance:
South Dakota Department of Environment and Natural Resources

Objective 4: Quality Assurance/Quality Control

Approved Quality Assurance/Quality Control (QA/QC) procedures will be used to ensure that all samples are accurate and defensible.

TASK 8 A minimum of 10 percent of the total water quality and biological samples will be collected for QA/QC purposes. QA/QC samples will consist of field blanks and field replicate samples. An estimated 100 water quality QA/QC samples and 16 biological QA/QC samples (eight macroinvertebrate samples and eight periphyton samples) will be collected during the project. The

collection of all field data will be accomplished in accordance with the WRAP SOP.

All QA/QC activities will be conducted in accordance with the Nonpoint Source Program Quality Assurance Project Plan.

The activities involved with QA/QC procedures and the results of QA/QC monitoring will be compiled and reported on in a section of the final project report and in all project quarterly progress reports.

PRODUCTS:

An estimated 200 (100 replicate and 100 blank sample) QA/QC samples collected for tributary sites.

An estimated 4 bacterial tracking QA/QC samples

An estimated 8 QA/QC samples each will be collected for macroinvertebrates, periphyton, ash-free dry weight, and chlorophyll *a*.

COSTS: \$32,400

PPG Funds: \$16,200

RESPONSIBLE AGENCIES:

Task Responsibilities:

Project Coordinator

Project Sponsor

Design and Technical Assistance:

South Dakota Department of Environment and Natural Resources

Objective 5: Landuse Modeling

Potential impacts of agricultural land uses on the water quality within the James River watershed will be evaluated using the Annualized Agricultural Non-Point Source (AGNPS) model, a landuse simulation computer model.

TASK 9 Determine run-off from the AGNPS model

Information will be gathered to define the physical characteristics of the watershed (topography, soils, geology, hydrology, etc.). Landuse information will also be collected via LANSAT imagery if available.

A Rapid Geomorphic Assessment (RGA) will be conducted at all of the road crossings on the major tributaries to the James River as well as the river itself. This data will be used to target model applications.

AnnAGNPS model will be used to identify and prioritize critical areas of non-point source pollution within the study watershed and to estimate soil and nutrient loss and delivery from these critical areas.

The CONCEPTS model, or Conservational Channel Evolution and Pollutant Transport System model, will be used to simulate the stream channel and to evaluate the long-term impact of rehabilitation measures to stabilize the stream system and reduce sediment yield.

Soil samples will be collected from bank locations based on results of the RGA survey. An estimated 100 soil samples will be collected.

PRODUCTS:

RGA assessments of the entire basin.

Landuse data collected and analyzed for the prioritization of critical cells in the watershed

COSTS: \$20,000

PPG Funds: \$15,000

RESPONSIBLE AGENCIES:

Task Responsibilities:

Project Coordinator

Project Sponsor

Design and Technical Assistance:

South Dakota Department of Environment and Natural Resources

EROS

Objective 6: Public Participation and Involvement

TASK 10 Disseminate project information to the public.

Informational meetings will be held on a quarterly basis for the public and to inform the involved parties of progress on the study. Public participation and involvement will be encouraged. These meetings will provide an avenue for input from the residents in the area. Notification of meetings will be made to local agencies and newspapers. In addition, a public web page will be maintained to provide the public with the latest available data as well as an overview of the project and status of work activities.

News releases will be prepared and released to local news media on a quarterly basis. These releases will be provided to local newspapers, radio stations and TV stations.

PRODUCTS:

10 Quarterly public meetings

10 News releases

Biannual progress reports for GRTS

Involvement and/or input from the public will be documented

COSTS: \$0

Federal Funds: \$0

RESPONSIBLE AGENCIES:

Task Responsibilities:

Project Coordinator

Project Sponsor

Design and Technical Assistance:

South Dakota Department of Environment and Natural Resources

Objective 7: Reporting

TASK 11 Provide reports as part of state and federal grant requirements. Semi-annual progress reports will be completed and presented at the appropriate general public meetings to keep the involved parties up-to-date with work activities and ensure their timely completion.

TASK 12 Develop final reports and TMDL summaries for each waterbody (river and lakes). Specific TMDL summaries for the parameters included on the 2002 303(d) list and any other parameters that may need a TMDL as found through the study will also be developed.

Document discharge measurements, water quality data, and methods used to calculate hydrologic budgets and pollutant loadings. Using the results of the landuse modeling, hydrologic and water quality budgets, and biological information, identify areas in the watershed that would require management practices.

Write a summary of historical water quality and landuse information and compare with project data to determine any possible trends. Write a summary report of all QA/QC activities conducted during the project and include in the final project report.

Write a description of feasible restoration recommendations for use in planning a watershed nonpoint source implementation project, and develop a TMDL for the listed segments of the James River as well as Beaver and Carthage Lakes.

Based on the data and information compiled for the project, prepare a description of the physical, chemical, and biological condition of the river and its tributaries.

Technical Assistance with fisheries and endangered species or other field data collection activities
Local Support

USGS

Technical Assistance with flow data and other field data collection activities

US Fish and Wildlife Service

Technical Assistance with endangered species

Natural Resource Conservation Service

Technical Assistance with Ann-AGNPS landuse data collection and/or other data collection requiring local support

South Dakota Association of Conservation Districts

Local Support

- 4.2 Project activities will be coordinated with state, federal, and local government agencies through frequent personal communication and monthly meetings.
- 4.3 All pertinent water quality, water quantity and land use data will be gathered from all agencies.
- 4.4 No known monitoring efforts are taking place in the project area at this time.

5.0 EVALUATION AND MONITORING PLAN

- 5.1 The monitoring strategy is explained in Section 3. The project will produce semi-annual progress reports. The sampling and analysis procedures required to complete the tasks within Section 3 can be located in the State of South Dakota Water Resource Assistance Program Standard Operating Procedures for Field Samplers (WRAP SOP).

TABLE 4. Location of Sampling and Analysis Procedures for each applicable task involved with the Lower James River Assessment Project.

TASK NUMBER	TASK DESCRIPTION	ACTIVITY	REFERENCE IN SDWRA-2003 SOP
Task 1	Developing hydrographs.	Discharge measurements	Vol I Section 12.0 pages 3-7
Task 2	Collect stream water quality samples	Water Quality Monitoring	Vol I. Section 12.0 pages 7-15
Task 3	Collect benthic macroinvertebrate samples.	Biological Sampling	Vol II Section 6.0
Task 4	Collect periphyton samples.	Biological Sampling	Vol II Section 5.0
Task 5	Collect stream habitat surveys	Habitat Surveys	Vol II Section 9.0
Task 6	Collect inlake water quality samples.	Water Quality Sampling	Vol I Section 14.0
Task 7	Conduct a macrophyte and shoreline survey on the lakes.	Shoreline Survey	Vol II Section 2.0
Task 8	The collection of all field water quality data will be accomplished in accordance with the Standard Operating Procedures for Field Samplers, South Dakota Nonpoint Source Program.	Quality Assurance	Vol I Section 8.0
Task 9	Use of the ANNAGNPS computer model	Watershed Modeling	Vol I Section 13.0

- 5.2 This assessment project consists of a combination of chemical, hydrologic, land use and biological analyses. Monitoring sites will be maintained and sampled on the James River and selected tributary watersheds. Ambient samples will be collected along with spring runoff and storm events. Stream discharge will be routinely measured. The chemical, physical, and biological parameters to be sampled during this project can be located in Tables 2 and 3. Loads will be calculated based on the samples and data collected with the approved methods identified in Section 5.1. A TMDL summary report will be produced for the portion of the James River from the Beadle and Sanborn County Line to the Missouri River. A TMDL will also be calculated for Lake Carthage and Beaver Lake
- 5.3 All water quality monitoring will be done in accordance with the approved South Dakota Non-point Source Program Quality Assurance/Quality Control Project Plan and the (WRAP SOP). Results from all water-quality monitoring efforts from the Lower James River Watershed Assessment Project will be reported in the final project report. Data will be managed by the local project sponsor and the

South Dakota Department of Environment and Natural Resources and maintained in a computer database. All sample data will ultimately be entered in the U.S. EPA STORET Program by the South Dakota Department of Environment and Natural Resources. This data will be used as the foundation of a Watershed Implementation Project proposal.

- 5.4 During the study staff will be using the AnnAGNPS and CONCEPTS Models to target critical cells and develop load reductions for the watershed. Staff will use the FLUX model to develop annual loads and to stratify the data for analysis if needed. Staff will use the BATHTUB model to predict the water quality response to reduced loadings.
- 5.5 It is hoped that this assessment effort will lead to one or more implementation plans to improve water quality in the Lower James River Watershed.

6.0 BUDGET

Part 1. Funding by Source

Funding By Source		2005	2006	2007	2008	Total
Section 319	\$ 12,033.00	\$ 58,285.00	\$ 70,203.00	\$12,256.00	\$152,777.00	
PPG Carryover	\$ 53,923.00	\$123,300.00	\$ -	\$ -	\$177,223.00	
Section 604b			\$ 60,000.00	\$ -	60,000.00	
Local Funds	\$ 11,336.00	\$ 76,998.00	\$115,630.00	\$16,036.00	\$220,000.00	
Total Budget	\$ 77,292.00	\$258,583.00	\$245,833.00	\$28,292.00	\$610,000.00	

Part 2 – See page 30.

7.0 PUBLIC INVOLVEMENT

See Section 3.2, Objective 6.

8.0 REFERENCES CITED

South Dakota Department of Environment and Natural Resources (SDDENR). 2002. The 2002 South Dakota Report to Congress. SDDENR, Pierre, SD.

SD Department of Environment and Natural Resources. 2003. Standard Operating Procedures for Field Samplers Volume I – Tributary and Inlake Sampling Techniques.

SD Department of Environment and Natural Resources. 2003. Standard Operating Procedures for Field Samplers Volume II – Biological and Habitat Sampling. (Draft Version).

SD Department of Game, Fish, and Parks. 2003. South Dakota Natural Heritage Program.

Table 5. Lower James River Watershed Assessment Milestone Chart

	2005			2006					2007					2008													
	O	N	D	J	F	M	A	M	J	J	A	S	O	N	D	J	F	M	A	M	J	J	A	S	O	N	D
Objective 1: Stream Water Quality Sampling																											
Objective 2: Biological Sampling																											
Objective 3: Lake Assessment																											
Objective 4: Quality Assurance/ Quality Control																											
Objective 5: Landuse Modeling																											
Objective 6: Public Participation																											
Objective 7: Final Report																											
TMDL Review and Approval																											

Part 2 Funding by Source

Part 2 funding by Source		Year				Fund Source				
	Total	2005	2006	2007	2008	PPG	319	604	JRWDD Cash	JRWDD InKind
Salary and Finge	\$230,720.00	\$ 19,760.00	\$ 95,600.00	\$ 95,600.00	\$ 19,760.00		\$ 138,432.00		\$ 92,288.00	
Office Rent/ Utilities	\$ 15,000.00	\$ 1,500.00	\$ 6,000.00	\$ 6,000.00	\$ 1,500.00	\$ 7,000.00	\$ 2,000.00		\$ 6,000.00	
Travel	\$ 32,000.00	\$ 3,200.00	\$ 12,800.00	\$ 12,800.00	\$ 3,200.00	\$ 16,223.00	\$ 2,327.00		\$ 13,450.00	
Equipment	\$ 55,000.00	\$ 47,000.00	\$ 4,000.00	\$ 4,000.00		\$ 51,000.00	\$ 4,000.00			
Supplies	\$ 5,000.00	\$ 2,000.00	\$ 1,500.00	\$ 1,500.00		\$ 3,500.00			\$ 1,500.00	
Telephone	\$ -	\$ -	\$ -	\$ -	\$ -					
Objective 1: Stream Sampling	\$138,000.00	\$ -	\$ 69,000.00	\$ 69,000.00	\$ -	\$ 49,750.00		\$60,000.00	\$ 28,250.00	
Objective 2: Biological Monitoring										
Macroinvertebrate Sampling	\$ 17,100.00		\$ 8,550.00	\$ 8,550.00		\$ 8,550.00			\$ 8,550.00	
Bacterial Source Tracking	\$ 6,000.00		\$ 3,000.00	\$ 3,000.00		\$ 3,000.00			\$ 3,000.00	
Subtotal	\$ 23,100.00		\$ 11,550.00	\$ 11,550.00		\$ 11,550.00			\$ 11,550.00	
Objective 3: Lake Sampling	\$ 11,250.00		\$ 7,000.00	\$ 4,250.00		\$ 7,000.00			\$ 4,250.00	
Objective 4: QA/QC										
Water Quality Analysis	\$ 30,000.00		\$ 15,000.00	\$ 15,000.00		\$ 15,000.00			\$ 15,000.00	
Bacterial Source Tracking	\$ 600.00		\$ 300.00	\$ 300.00		\$ 300.00			\$ 300.00	
Macroinvertebrate Sampling	\$ 1,800.00		\$ 900.00	\$ 900.00		\$ 900.00			\$ 900.00	
Subtotal	\$ 32,400.00		\$ 16,200.00	\$ 16,200.00		\$ 16,200.00			\$ 16,200.00	
Objective 5; Landuse Modeling	\$ 20,000.00		\$ 15,000.00	\$ 5,000.00		\$ 15,000.00	\$ 5,000.00			
Objective 6: Public Participation										
Objective 7: Reporting										
Administrative	\$ 44,880.00	\$ 3,432.00	\$ 19,008.00	\$ 19,008.00	\$ 3,432.00					\$44,880.00
Contingencies	\$ 2,650.00	\$ 400.00	\$ 925.00	\$ 925.00	\$ 400.00		\$ 1,018.00		\$ 1,632.00	
Total	\$610,000.00	\$ 77,292.00	\$ 258,583.00	\$ 245,833.00	\$ 28,292.00	\$177,223.00	\$ 152,777.00	\$60,000.00	\$ 175,120.00	\$44,880.00

**SOUTH DAKOTA NONPOINT SOURCE PROGRAM
QUALITY ASSURANCE PROJECT PLAN**

SUBMITTED BY:

**SOUTH DAKOTA DEPARTMENT OF ENVIRONMENT AND NATURAL RESOURCES
DIVISION OF FINANCIAL AND TECHNICAL ASSISTANCE
WATER RESOURCES ASSISTANCE PROGRAM**

**Prepared by: Robert Smith
February, 2001**

Project Title: Lower James River Watershed Assessment

APPROVED BY:



South Dakota Watershed Protection Program
Environmental Senior Scientist, Assessment Section

5-24-05
Date



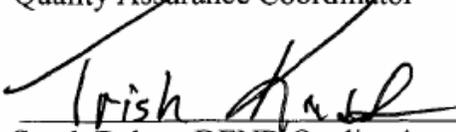
South Dakota Watershed Protection Program
Project Officer

5-23-05
Date



South Dakota Watershed Protection Program
Quality Assurance Coordinator

5-24-05
Date



South Dakota DENR Quality Assurance Officer

5-24-05
Date